National Institute of Environmental Health Sciences

Impact of climate variability on summer fires in a Mediterranean environment (northeastern Iberian Peninsula)

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Abstract:

We analyse the impact of climate interannual variability on summer forest fires in Catalonia (northeastern Iberian Peninsula). The study period covers 25 years, from 1983 to 2007. During this period more than 16000 fire events were recorded and the total burned area was more than 240 kha, i.e. around 7.5% of whole Catalonia. We show that the interannual variability of summer fires is significantly correlated with summer precipitation and summer maximum temperature. In addition, fires are significantly related to antecedent climate conditions, showing positive correlation with lagged precipitation and negative correlation with lagged temperatures, both with a time lag of two years, and negative correlation with the minimum temperature in the spring of the same year. The interaction between antecedent climate conditions and fire variability highlights the importance of climate not only in regulating fuel flammability, but also fuel structure. On the basis of these results, we discuss a simple regression model that explains up to 76% of the variance of the Burned Area and up to 91% of the variance of the number of fires. This simple regression model produces reliable out-of-sample predictions of the impact of climate variability on summer forest fires and it could be used to estimate fire response to different climate change scenarios, assuming that climate-vegetation-humans-fire interactions will not change significantly.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Precipitation, Temperature

Extreme Weather Event: Wildfires

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Spain

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content